produces current corresponding to a concentration of a particular gas component of the gas to be measured by applying a given amount of voltage to the electrodes of the second electrochemical cell; and

a third pair of electrodes comprising an oxygen sensing electrode and a reference oxygen sensing electrode to form a third electrochemical cell together with the first solid electrolyte plate, wherein the oxygen sensing electrode is located on a given surface of the first solid electrolyte plate to communicate with an outside of the device and the reference oxygen sensing electrode is located on the given surface of the first solid electrolyte plate to be exposed to the first reference gas chamber, whereby the third electrochemical cell measures oxygen of the gas to be measured between the electrodes thereof.

B6 Cont'd

13. (*New*) The sensing device of claim 1, further comprising a heater disposed to provide the solid electrolyte plates with heat, wherein the second electrochemical cell is positionally more distant from the heater than the first electrochemical cell.--

REMARKS

Upon entry of the present amendment, claims 1-10 and 12-13 are pending. By the present amendment, the specification has been amended to correct minor typographical informalities, claim 11 has been canceled without prejudice, claims 1-10 have been amended for clarity and claims 12 and 13 have been added.

Applicant's representative appreciates the courtesies extended by Examiner Tung during the telephonic interview conducted March 19, 2003 with respect to the failure of the Office Action to include a Notice of References Cited and copies of the applied references. The Examiner has promised to forward these documents as soon as possible. With respect to the outstanding Information Disclosure Statement, the Examiner has agreed to forward an initialed copy of the PTO-1449 with the next communication.

Submitted herewith is a Request for Approval of Drawing Corrections showing changes to Figures 2, 7-9, 12 and 13 in red. Approval of these drawing corrections is respectfully requested.

The rejection of claims 1-9 and 11 under 35 U.S.C. §103(a) over admitted prior art (Fig. 1 of the instant application) in view of Hasei et al. (U.S. Patent No. 6,319,377, hereinafter "Hasei") or Kato et al. (U.S. Patent No. 5,928,494, hereinafter "Kato") is respectfully traversed. Without acquiescing in the rejection, claim 11 has been canceled without prejudice and claims 1-10 have been amended. Accordingly, the rejection will be discussed with respect to the pending amended claims.

At the outset, it is noted that the Office Action's characterization of the admitted prior art is incorrect. Specifically, the admitted prior art shows that the first (pumping) and third (measuring) electromechanical cells 83 and 84 are located on the *same* solid electrolyte plate (see, *e.g.*, Page 2, lines 24-26, as amended). This results in the disadvantages of the prior art enumerated in the application, namely that the voltage applied to the first electromechanical cell fluctuates and its output is much larger than

that of the third electromechanical cell which influences the output of the third electrochemical cell.

The claimed invention, on the other hand recites a sensor having a third electrochemical cell for measuring the concentration of an exhaust gas from outside the sensor and that *the first and third electromechanical cells are formed on mutually different solid electrolyte plates*. This arrangement overcomes the disadvantages recited in the application with respect to the prior art.

Both Hasei and Kato provide a gas-concentration detecting or sensing structure in which two electrodes for pumping an detection are disposed on the same surface of a solid electrolyte body or partition. See, *e.g.*, Hasei Figure 1 and Col. 4, line 63 - Col. 6, line 38, and Kato Figure 3 and Col. 6, line 55 - Col. 7, line 26.

Therefore, even if, *arguendo*, the combination of the admitted prior art and either Hasei or Kato were proper, the combination nevertheless fails to render the claim obvious. In particular, the combination of references would result in a structure in which the electrodes of both the first electrochemical cell and the third electrochemical cell are disposed on the same solid electrolyte plate. This arrangement is inapposite to the claimed invention which specifically recites that the first and third electrochemical cells are formed on mutually different solid electrolyte plates. Accordingly, the proposed combination of references fails to render the claimed invention obvious. Therefore, reconsideration and withdrawal of the rejection are respectfully requested.

The rejection of claim 10 under 35 U.S.C. §103(a) over the admitted prior art in view of Hasei or Kato and Shibata et al. (U.S. Patent No. 4,882,033, hereinafter

"Shibata"). is respectfully traversed. Without acquiescing in the rejection, claim 10 has been amended for clarity. Accordingly the rejection will be discussed with respect to the claim as amended.

It is respectfully submitted that Shibata fails to overcome the fundamental deficiencies noted above with respect to the admitted prior art and Hasei or Kato. Therefore, even if, *arguendo*, the combination of Shibata with the admitted prior art, Hasei or Kato were proper, the combination nevertheless fails to render the claimed invention obvious. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

In view of the foregoing, it is respectfully submitted that the entire application is in condition for allowance. Favorable reconsideration of the application and prompt allowance of the claims are earnestly solicited.

Should the Examiner deem that further issues require resolution prior to allowance, the Examiner is invited to contact the undersigned attorney of record at the telephone number set forth below.

Respectfully submitted,

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MARKED-UP VERSION OF AMENDED SPECIFICATION PARAGRAPHS

Page 2, paragraph at lines 24-29:

This drawback is mainly [resulted] results [from that] because the first and [second] third electrochemical cells 83 and 84 are located on the same solid electrolyte plate. The voltage applied to the first electrochemical cell 83 fluctuates and its output is fairly larger in amount than that of the third electrochemical cell 84, which largely influences the output of the third electrochemical cell 84.

Page 2, paragraph at lines 30-35:

As understood from Fig. 1, a total of five plates ranging from the first solid electrolyte plate 92 to the second one 96 are present between two electrodes of the second electrochemical cell [84] 85. This presence gives rise to a larger amount of inner resistance to the second electrochemical cell, making the second electrochemical cell liable to influences of surrounding conditions such as temperature.

Page 4, paragraph at lines 3-6:

Because each of the first and third electrochemical cells is disposed with [a] different solid electrolyte [plate] plates, the third electrochemical cell shows resistance to influence of temporal changes in voltage applied to the first electrochemical cell.

Page 10, paragraph at lines 13-18:

Each of a first and second chambers 11 and 12 is formed as space partitioned by the first and second solid electrolyte plates 53 and 55 and the spacer 54. A second reference gas chamber 14 is made up of space partitioned by the second solid electrolyte plate 55 and the spacer 56. As shown in Figs. 2 and 3, the first and second chambers 11 and 12 are connected through a second thin diffusive resistance passage 120.

MARKED-UP VERSION OF AMENDED CLAIMS

1. (*Amended*) A compound layered type of sensing device, comprising:

~~a plurality of solid electrolyte plates; and~~

a plurality of pairs of electrodes, [first to third electrochemical cells each having a single] wherein each pair of electrodes is disposed respectively on surfaces of one of the plurality of [the] solid electrolyte plates, forming first to third electrochemical cells, [in which a concentration of gas specified from] wherein a gas to be measured is pre-processed [based on] under oxygen pumping carried out by the first electrochemical cell, a concentration of a particular gas component of the gas to be measured being [is] detected by the second electrochemical cell and a difference in electromotive force between the gas to be measured and a reference gas [is] being detected by the third electrochemical cell,

wherein [the] a single pair of electrodes of the third electrochemical cell is disposed on [a] the same surface of one of the plurality of solid electrolyte plates, and [both of] the first and third electrochemical cells are located [with] on mutually different solid electrolyte plates [different ones] of the plurality of solid electrolyte plates.

2. (*Amended*) The sensing device of claim 1, further comprising first and second chambers formed in the device, [and into which] the gas to be measured [is] being introduced into the first and second chambers, and a fourth electrochemical cell configured to detect [the] a concentration of [the] oxygen of the gas to be measured present in at least one of the first and second chambers.

3. (*Amended*) The sensing device of claim 2, wherein the first chamber is formed to communicate [communicates] with an outside of the device via a first diffusive resistance passage and the second chamber is formed to communicate [communicates] with the first chamber via a second diffusive resistance passage, wherein

one of the two electrodes of the first electrochemical cell [being configured, with one surface thereof exposed to] is located to be exposed to the first chamber[,so as to take oxygen in and out to and] so that the first electrochemical cell permits a given amount of oxygen to be introduced into or from the first chamber correspondingly to an amount of voltage applied to the first electrochemical cell, and

one of the two electrodes of the second electrochemical cell [being configured, with one surface thereof exposed to] is located to be exposed to the second chamber[, so as to detect current corresponding] so that applying a given amount of voltage to the electrodes of the second electrochemical cell permits the second electromechanical cell to detect current corresponding to the concentration of [the specified] a particular gas component [contained in] of the gas to be measured [by applying a predetermined voltage to the second electrochemical cell].

4. (*Amended*) The sensing device of claim 3, further comprising a plurality of reference gas chambers formed in the device,

wherein [both of the second and fourth electrochemical cells are disposed to a] one of the two electrodes of the second electrochemical cell and one of the two

electrodes of the fourth electrochemical cell are located to be exposed to the same [one] reference gas chamber of the plurality of reference gas chambers and the other of the two electrodes of the second electrochemical cell and the other of the two electrodes of the fourth electrochemical cell are located to be exposed to either one of the first [and] or second chambers, respectively.

where is basis for exposing "the two other" electrodes to [at] gas space?

5. (*Amended*) The sensing device of claim 4, wherein [each of the first and third electrochemical cells is disposed to a different one] one of the two electrodes of the first electrochemical cell and one of the two electrodes of the third electrochemical cell are located to be exposed to mutually different reference gas chambers of the plurality of reference gas chambers.

6. (*Amended*) The sensing device of claim 2, further comprising a plurality of reference gas chambers formed in the device,

wherein [both of the second and fourth electrochemical cells are disposed to a] one of the two electrodes of the second electrochemical cell and one of the two electrodes of the fourth electrochemical cell are located to be exposed to the same [one] reference gas chamber of the plurality of reference gas chambers and the other of the two electrodes of the second electrochemical cell and the other of the two electrodes of the fourth electrochemical cell are located to be exposed to either one of the first [and] or second chambers, respectively.

7. (*Amended*) The sensing device of claim 6, wherein [each of the first and third electrochemical cells is disposed to a different one] one of the two electrodes of the first electrochemical cell and one of the two electrodes of the third electrochemical cell are located to be exposed to mutually different reference gas chambers of the plurality of reference gas chambers.

8. (*Amended*) The sensing device of claim 3, further comprising a plurality of reference gas chambers formed in the device,

wherein [each of the first and third electrochemical cells is disposed to a different one] one of the two electrodes of the first electrochemical cell and one of the two electrodes of the third electrochemical cell are located to be exposed to mutually different reference gas chambers of the plurality of reference gas chambers.

9. (*Amended*) The sensing device of claim 2, further comprising a plurality of reference gas chambers formed in the device,

wherein [each of the first and third electrochemical cells is disposed to a different one] one of the two electrodes of the first electrochemical cell and one of the two electrodes of the third electrochemical cell are located to be exposed to mutually different reference gas chambers of the plurality of reference gas chambers.

10. (*Amended*) The sensing device of claim 1, wherein [an alumina-made] a plate comprising alumina is placed [intervenes] between the first and second electrochemical cells so that both the first and second cells are insulated to each other.